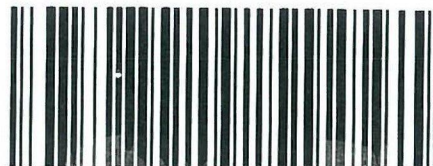




Office of Water



PCU028465

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Our ref : ER21624
Your ref: MP 05_0091

Attention: Marek Holin

Dear Mr Holin

**Bayside Brunswick Concept Plan (MP 05_0091), Brunswick Heads, Byron Shire Council,
Exhibition of Environmental Assessment**

I refer to your letter dated 13 September 2011 and provide the Office of Water's comments (**Attachment A**) and recommended conditions of approval (**Attachment B**) for consideration.

If you require any further information please contact Brett McCulloch, A/Planning and Assessment Coordinator on (02) 6676 7381 at the Murwillumbah Office.

Yours sincerely

Mark Mignanelli
Manager Major Projects, Mines and Assessment
24 November 2011



Bayside Brunswick Concept Plan (MP 05_0091) Environmental Assessment (EA) Review

1. Project proposal and site description.

The concept plan (CP) is for a 178 residential subdivision comprising a mix of single dwelling, dual occupancy and medium density lots on Lot 1 DP871039 (project site) in the Byron Local Government Area. The CP will also include the provision of local parks and the dedication of an 8.2 Ha parcel of land adjacent to Simpsons Creek for the purpose of an environmental park. The western portion of the site is zoned Residential (2(a)) while the area to the east is Environmental Protection Coastal Habitat (7(b)) and to the north-east Environmental Protection Wetland (7(a)) under the Byron Local Environmental Plan 1988 (Byron LEP). The project site is covered by the State Environmental Planning Policy (SEPP) 71 Coastal Protection and part of the eastern boundary is under SEPP 14 Coastal Wetland (Attachment C).

The geology of the project site is Quaternary regolith and is categorised as coastal dunes composed of marine sediments and deposits of sand estuarine sediments along Simpsons Creek. The soil landscape of the project site is aeolian derived and of extremely low level to gently undulating beach ridge plains on Pleistocene beaches and sand dunes (elevation and relief 1 - 2 m, slopes <5%). The topography is a dune/swale system which runs parallel to the coast. The dune and swales have stands of dry and wet heathland respectively. The soils are deep well drained podzols on dunes and deep water logged acid peats in swales.

The landscape for the western portion of the project site is described as a sediment basin composed of mixed estuarine and aeolian origin forming level to undulating plains (relief <3 m, elevation < 5 m and slopes <1%). The area is extensively cleared with stands of open and closed forests. The soils vary from moderately well drained prairie soils in the basaltic zones and well drained podzols and acid peats near barrier systems. The soils on the project site are non-cohesive (high wind erosion hazard), highly permeable and acidic soils of very low fertility.

The project site has permanent high water tables and the soils on the site are often waterlogged and have a low water-holding capacity with localised salinity (Morand, D.T. (1994). *Soil Landscapes of the Lismore-Ballina 1:100 000 Sheet Map*, Soil Conservation Service of NSW, Sydney). The Office of Water has identified an acid sulphate soil (ASS) risk at 2–4 m for most of the land covering the project site with the exception of an area in the north-eastern portion of the site which is high ASS risk 0-1 m (Attachment C).

2. Water balance and water licensing requirements.

The CP is required to take into account the objects and water management principles of the *Water Management Act 2000* (WMA) and statutory requirements of the *Water Act 1912* (WA) administered by NOW. The project site is to be covered by the proposed Water Sharing Plans (WSP) for the Brunswick River catchment and the Brunswick Coastal Sands for surface water and groundwater sources respectively, which are both still under development.

As the project site is currently not subject to a WSP under the WMA, the take and use of surface and groundwater sources are administered under Part 2 and 5 of the WA respectively. It should be noted that Part 2 of the WA may not apply to the take and use of water from that part of Simpsons Creek adjacent to the project site, as it is tidal (Attachment C) and most probably unsuitable for irrigation or stock watering. For example, under the WA (Part 2, div.1, s.5) a "river" does not include those waters of a tidal river that at any time are not capable of being

used for irrigation or for watering stock. Therefore, the tidal portion of Simpsons Creek is not subject to the s.22BA embargo order under the WA (NSW Government Gazette No.57, pg 3889, 12 May 2000). Further, as mentioned above the project site is in the coastal sands and accordingly the section 113A embargo on further applications for sub surface licences for alluvial groundwater sources does not apply (NSW Government Gazette No.42, pg 2689, 11 April 2008).

An existing bore licence currently exist on the site (30BL185289) which authorises three wells (bores) for monitoring purposes in the name of the applicant Codlea Pty Ltd (Attachment C). In s.3.1 (pg 3) of the Surface & Groundwater Assessment (SGA) prepared by Waste Solutions Australia Pty Ltd, it is stated that three bore have been constructed at sites in Figure 2 in Appendix A. The Office of Water databases show that *Form A* (geological core logs) relating to the bores have not been forwarded to the Water Licensing Branch in either Murwillumbah or Grafton. The Applicant must forward to Office of Water the locality and details of the bores on a *Form A* to the Office of Water Licensing Branch at either the Murwillumbah or Grafton office as required in condition 2 of the licence (30BL185289). All the details which are required in completing the *Form A* are located at <http://www.water.nsw.gov.au/Water-licensing/Applications/default.aspx>.

The ASS assessment (ASSA) prepared for the applicant by Border-Tech Geotechnical Engineering Services (BTGC) indicated in s.1.0 (pg 1) that 23 ASS test bore holes were constructed in November 2003 on the project site. In s.1.1 (pg 1) of the ASSA it is stated that an additional 7 bore holes were constructed to 2.0 m below surface level for further ASS testing in 2009. The ASS bore hole locations are shown in Appendix 1 of the ASSA. In s.2.2 (pg 4) of the ASSA it was stated that bores intercepted groundwater at varying depths. The Geotechnical Engineering Assessment (GEA), also prepared by BTGC, informs in s.4 (pg 60) that 27 bore holes were drilled between 29 April and 1 May 2009 as shown in Appendix A. If the bores mentioned above have not been decommissioned and are to be used for further monitoring purposes, a licence under Part 5 of the WA is required. In addition, the Office of Water requests the applicant to consult with its hydrogeologist and licensing staff at Grafton or Murwillumbah if further take and/or use of groundwater is required for the development.

The construction of earthworks to provide for erosion and sediment control is mentioned in s.6 (pg 22) of Water Cycle Management Stormwater Concept (WCMSC). Accordingly, the applicant must be conversant of activities that concur with the harvestable right order in connection with the construction and use of the dam/s on land within the harvestable rights area, which include an exemption from requirement of a control activity approval Schedule 5, Part 2, 20, *Water Management (General) Regulation 2011* (WMR).

The applicant must also be aware that any dams used solely for the purposes of capture, containment and recirculation of drainage and/or effluent, surface water erosion and sediment controls or approved by the Minister for specific environmental management purposes, are considered special dams and are exempt from the calculation of the MHRDC for a property, but the dam construction may require consent (possibly as part of a licence under the WA) from the Office of Water.

The special exempt dams are defined as an "excluded work" under the WMA and are exempt from the requirement for an access licence under the WMR (Part 2, div.2, cl.18), water use approval (Part 3, sub div.2, cl.31) and a water supply work approval (Part 3, sub div.3, cl.36) once a WSP has commenced for that part of the project site relevant to the plan. The "excluded work" must exist on a minor stream (i.e. < 3rd order) under Chapter 3, Part 1, s.53(1)(b) of the

WMA or off-river. For further information regarding the above provisions please contact NOW's licensing staff at Grafton or Murwillumbah.

In the event that a groundwater or surface water licence is required under the WA for any excavation or any other major works that intercept groundwater or capture surface water runoff (e.g. stormwater detention basins), it is a standard practice within the Office of Water that a security deposit (Bond or Bank Guarantee) be sought from the applicant prior to the commencement of such a project to remediate any potential or unforeseen impact(s) to the surface and/or groundwater source to a value of \$250,000. Any additional requirements for a security deposit (above the \$250,000 already indicated) to remediate other potential impacts for this project will be determined during the licensing process.

The Office of Water acknowledges that the applicant proposes the installation of rainwater tanks with any new dwelling and the implementation of Building Sustainability Index (BASIX). Nevertheless, NOW recommends the applicant prepare Groundwater and Surface Water Management Plans (GWMP and SWMP) that incorporate a detailed description of a sustainable and efficient water supply which can be sourced and implemented with minimal reliance on accessing valuable surface and groundwater resources. The SWMP and/or GWMP should include an assessment of the overall water balance through the implementation of BASIX, Integrated Water Cycle Management and Water Sensitive Urban Design (WSUD). The applicant must further elaborate in the water management plan/s how the proposal complies with the provisions of BASIX.

3. Water cycle, ASS management and erosion and sediment control provisions.

In s.2 (pg 2-6) of the WCMSC (Appendix L) it mentions that the proposed stormwater concept will provide improvements to the existing poor drainage on the project site by reinstating and maintaining drainage paths. The common drainage lines will be protected by easements which will connect to a bio-retention basin. The intent is to maintain existing drainage paths and catchment boundaries for surface flows and as far as practical for piped flows. It is envisaged that stormwater quality targets will be met and that controlled discharge of stormwater will be achieved from the treatment areas and detention in the main drainage reserve (Park 2, Figure 3), including treatment beds in sensitive areas. It is noted in s.3 (pg 10) the WCMSC that the WSUD concept has been adopted for stormwater treatment and quality. The Office of Water endorses the WSUD concept and the applicant's adoption of the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) modelling for the quantification of the existing and expected contaminant loads from the project as indicated in s.4 (pg 11) of the WCMSC. The use of gross pollutant traps and a bioretention system (i.e. bioretention basins and swales) are proposed in the CP to treat stormwater quality on the project site instead of permanent wetlands, which NOW endorses (WCMSC, s.10, pg 38). The depth of the bioretention basin and swales is proposed to be 0.3 m (s.4.5.2 & s.4.5.3 of WCMSC, pg15-17).

The Office of Water is satisfied that the applicant stormwater management arrangements for the site adequately addresses the type and location of on-site detention, major overland flows and discharge calculations and the quality direction and rate of surface and nutrient discharges from the site. However, for the type of development under application, the Office of Water main concerns and recommendations include but are not limited to:

1. the potential to contaminate groundwater through the direct infiltration of stormwater runoff or the construction of stormwater detention basins and swales that intercept the water table which may provide further movement of pollutants down gradient that could discharge to surface waters;

2. detention basins and swales that are constructed below the water table should be lined (clay or geo-fabric) to minimise the hydraulic connection with the surrounding groundwater system or if unlined constructed so that the base of the excavation is 1 m above the water table for most of the time;
3. the potential of ASS to be exposed when constructing detention basins, swales and drains creating acid leachate;
4. on coastal land of very low relief flooding is an issue especially considering the longer term possibility of sea level rise and increases in the range of inundation depths; and
5. all works that intercept groundwater must be licensed under Part 5 WA.

The Office of Water has management concerns and issues regarding stormwater detention basins and swales in relatively flat coastal floodplains with high water tables. In s.2.2 (pg 4) of the ASSA bore hole drilling carried out on 7 May 2009 encountered groundwater at approximately 0.5 m below the surface level in areas of very low relief to levels no deeper than 1.8 m in the more elevated positions in the project site. The proposed bioretention works are to be constructed at a depth of 0.3 m below the surface level. Therefore, the proposed bioretention works should not intercept groundwater. However, the Office of Water recommends the base of the proposed bioretention works be lined with clay or geo-fabric to minimise the hydraulic connection with the surrounding groundwater system or where possible the base of the excavation is 1 m above the water table. In summary, the Office of Water recommends a 1 m buffer above the highest predicted groundwater table for all excavations, in particular infiltration/detention basins; if the base of the excavation is within this 1 m buffer the applicant will need to implement impermeable liners to prevent direct infiltration to the groundwater and specify this requirement in the GWMP or SWMP. Furthermore, the Office of Water requires the applicant to provide more detail regarding the design of the bioretention system installed especially at the base of the works.

As shown on the Office of Water databases and from the research findings in s.2.3 (pg 4) of ASSA, there is a low risk of ASS at 1-4 m for the majority of the project site, except for the north-eastern portion which is high risk/probability of ASS at 0-1 m; however, this area is not proposed to be disturbed in the CP. As discussed in the ASSA, the sampling and analysis of bore holes across the area of the proposed development undertaken in 2003 and 2009 revealed that there are no ASSs present within the proposed building envelope to a depth of 2 m below the existing surface level (s.6 of ASSA, pg 6). In s.5.1 (pg 15) of the SGA, the pH monitored in a drainage line and groundwater bores were below 4.6.

The water from the drain is due to both surface and groundwater runoff which explains the similarity in pH readings. It was inferred that the acidity in the water was due to the type of vegetation present in the area (e.g. humic acid accumulation from wallum heath) and not from the disturbance of potential acid sulfate soils (PASS). Alternatively, the acidity in Simpsons Creek adjusted seasonally and was lower than the drain and bores. It is considered that the acidic surface and groundwater discharging into Simpson Creek is buffered by tidal flushing. In consideration of the above findings, the Office of Water is satisfied that no impact to PASS and actual ASS sediment is expected from the proposed development and no mitigation measures are necessary at this stage. However, the WCMSC does state in s.6 (pg 22) that: *"temporary rehabilitation shall be undertaken on disturbed areas where works have ceased and soils are expected to remain exposed for more than one month. The contractor will be expected to maintain all water and soil management devices on a daily basis and ensure all vegetation shall be retained beyond limit of works."* Presumably the exposed soil material will not be PASS. The Office of Water recommends that if any material excavated is low PASS material the soil be treated in accordance with the Acid Sulfate Soil Management Advisory Committee (ASSMAC) management guidelines (1998).

The Office of Water acknowledges in s.6 of WCMSC, pg 22, that the Applicant will ensure all proposed erosion and sediment control works implemented and installed will be consistent with the Blue Book - *Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition, 2004 (Landcom)* ("blue book"). NOW recommend that the Applicant provide evidence that sediment and erosion works and practices concur with the "blue book" and outline such in an erosion and sediment control plan which must be incorporated into a GWMP and/or SWMP.

4. Surface and groundwater quality and quantity monitoring, modelling and management.

The results of the two sampling events undertaken by Waste Solutions Australia Pty Ltd in preparation of the SGA varied in response to environmental factors such as rainfall and tidal activity. It was considered in the report that (s.7, pg 23, SGA) the proposed development "*has the potential to affect groundwater and surface water, and in turn the local ecosystem including the SEPP14 wetland habitat of the site*". The applicant must demonstrate in a SWMP and GWMP what mitigation measures will be adopted to avoid and/or treat the following potential impacts from the proposed development (s.6.1, pg22, SGA):

- TSS (total suspended solids) may increase in surface water due to erosion and runoff of cleared areas during construction stages of the proposed development;
- low conductivity in Simpsons Creek and high conductivity in groundwater from stormwater runoff discharge and reduced recharge respectively due to sealed surfaces on the site;
- decreases in groundwater level and flow rates from reduced recharge which may potentially impact on GDEs;
- eutrophication of water sources and higher pH from increase application of fertilisers and soil conditioning agents to gardens/lawns; and
- increased concentrations of TPH (total petroleum hydrocarbons), BTEX (benzene toluene ethyl-benzene xylene), pesticides and metal from road runoff and domestic activities.

The MUSIC modelling referred to in s.4.2.4 of the WCMSC allows for the following water quality parameters: flow, total suspended solids (TSS), total phosphorus (TP), total nitrogen (TN) and gross pollutants. The Office of Water acknowledges in s.5.3 of WCMSC (pg 20 &21) that the Applicant complies with the Byron Shire Councils (BSC's) stormwater quality targets (BSC's Stormwater Quality Control DCP (s.N7)) if stormwater treatment devices are installed. However, it is conceded in s.11 (pg 39) of WCMSC, to accurately determine the stormwater pollutant levels, further monitoring of water quality at a number of outlets and further downstream in the receiving waters is required.

To address concerns regarding the stormwater quality on the eastern side of the project site (Park 1) and the impacts on all surface water sources (e.g. Simpson Creek and other surface water sources within and surrounding the project site) and groundwater dependent ecosystems (GDE) (e.g. wetlands to the far east of the project site), the Office of Water recommends baseline monitoring for a minimum of 2 years fortnightly sampling for surface and groundwater quality and/or quantity. In addition to the monitoring already undertaken at the locations identified in Appendix A of the SGA, the Office of Water recommends a more extensive monitoring program which must include all aquifers, watercourses and wetlands within and adjacent to the project site. Furthermore, the Applicant must ensure that all monitoring bores are licensed accordingly.

The range of baseline water quality data for surface and groundwater must include but not limited to the following parameters: turbidity, pH, temperature, electrical conductivity, dissolved oxygen, biochemical oxygen demand, total suspended solids, nutrients (TP, TN, filtered N &

NO_x, TKN, nitrite & nitrate), oil and grease, cations/anions (Ca, Mg, Na, K/HCO₃, SO₄ and Cl), soluble aluminium, ammonium ion, arsenic, cadmium, copper, lead, nickel, zinc, TPH, BTEX, chlorophyll-a, faecal coliforms, enterococci, algae and blue-green algae. The monitoring of surface and groundwater should occur simultaneously so that valid statistical analyses can be applied to allow temporal comparisons between the systems. Until the baseline data has been reviewed and evaluated, the default trigger levels for ANZECC and ARMCANZ (2000) guidelines should be used and then revised after consultation with the Office of Water.

It would be beneficial for the GWMP and SWMP prepared by the applicant to incorporate the results of the baseline data monitoring already undertaken, proposed future monitoring and reporting programs, including a contingency plan, which are requested to be forward to the Office of Water for review. Furthermore, the Office of Water may condition the release of the Security Deposit (Bond or Bank Guarantee) based on the results of the water quality monitoring program providing the applicant has demonstrated that the proposal meets water quality requirements.

5. Riparian, wetland and estuary management

The property is located within 100 m of Simpsons Creek and Tyagarah Nature Reserve which is considered a sensitive coastal location. The vegetation of the property comprises of wallum heathland and woodland, which are highly restrictive vegetation communities in the Byron Shire. Further, the eastern section of the project site provides a significant component of a wildlife corridor extending along the western side of Simpsons Creek. The applicant must ensure that the proposed development does not have a significant impact on the natural environment, associated ecosystems and all water sources connected to and within the above Reserve, in particular those areas protected under Byron LEP (e.g. Environmental Protection Wetland 7(a)) and SEPP 14 Coastal Wetland within and adjacent to the project site (Attachment C). The SWMP and GWMP must address the necessary measures that will be required to ensure the development will not cause harm to these natural environments protected under the Byron LEP and SEPP14 Coastal Wetland and demonstrate concurrence with their aims, objectives and/or principles.

The Office of Water recommends 100 metre buffers to estuarine aquatic vegetation such as mangroves and saltmarsh from the areas to be developed and or disturbed by the proposed development. The proposal must not contaminate groundwater quality (NSW Groundwater Quality Protection Policy 1998) or impact on GDEs (NSW Groundwater Dependent Ecosystem Policy 2002). The Applicant should address the likelihood for groundwater contamination and outline any protective measures to minimise the threat in the GWMP.

The Applicant is to give consideration to the NSW State Rivers and Estuaries Policy 1993 when preparing the SWMP and GWMP. The Applicant is to specifically address the potential impacts of surface water runoff and infiltration on the nearby groundwater sources and SEPP 14 wetlands and discuss remediation actions proposed in the SWMP and/or GWMP. The Applicant must address the direct and indirect impacts on the riparian zone and identify conservation (riparian) buffer zones between the development areas and adjoining vegetation, having regard to a recommended minimum 50 m width and findings and recommendations of the Brunswick Estuary Management Study and Management Plan.

Although a controlled activity approval is not required under NSW Planning legislation relevant to major projects, the Applicant is requested to take into account the requirements of relevant water related legislation and NOW's *Guidelines for Controlled Activities*. The guidelines

recommend the following minimum core riparian zone (CRZ) widths which should be adhered to where appropriate:

- i) **CRZ of 10 metres** (on both sides of the watercourse) for:
 - o Any first order watercourse where there is a defined channel where water flows intermittently;
- ii) **CRZ of 20 metres** (on both sides of the watercourse) for:
 - o Any permanently flowing first order watercourse, or
 - o Any second order watercourse where there is a defined channel where water flows intermittently or permanently;
- iii) **CRZ of 20 - 40 metres** (on both sides of the watercourse) for:
 - o Any third order or greater watercourse where there is a defined channel where water flows intermittently or permanently. Includes estuaries, wetlands and any parts of rivers influenced by tidal waters – (merit assessment based).

In addition to the above recommended CRZ widths an additional **vegetated buffer of 10 metres** should be provided on both sides of the watercourse measured from the outer edge of the CRZ to allow for edge effects.

The asset protection zone is not to form part of the CRZ or vegetated buffer. In relation to the management of the SEPP 14 wetland and any other affected wetland within and outside of the project site, the applicant must be consistent with NSW Wetland Management Policy which is available at <http://www.water.nsw.gov.au/Water-Management/Law-and-Policy/Key-policies/default.aspx>. The above provisions must be addressed in the SWMP and/or GWMP where relevant by the applicant in consultation with the NOW.

End of Attachment A
24 November 2011

NSW Office of Water's Recommended Conditions of Approval

1. The Applicant to prepare a Surface Water Management Plan in consultation with and to the satisfaction of the NSW Office of Water prior to the commencement of works.
2. The Applicant to prepare a Groundwater Management Plan in consultation with and to the satisfaction of the NSW Office of Water prior to commencement of works.
3. The Applicant to obtain the relevant licences to the satisfaction of the NSW Office of Water under the *Water Act 1912* and/or the *Water Management Act 2000* (whichever is relevant at the time application is made) for all activities that intercept or extract groundwater and surface water prior to commencement of these activities.
4. A Security Deposit (Bond or Bank Guarantee) of an amount specified by the NSW Office of Water for the proposed development shall be paid.
5. The Applicant must ensure that there are no infiltration or detention basins to be located within a one (1) metre buffer above the highest predicted groundwater table or the applicant will need to implement impermeable liners to prevent direct infiltration to the groundwater to the satisfaction of the Office of Water.
6. The Applicant must consult with the Office of Water if there are any future works that intercept subsurface water.
7. The Applicant must adhere to the Core Riparian Zone widths on both sides of watercourses and the additional vegetated buffers to allow for edge effects detailed in the NSW Office of Water's *Guidelines for Controlled Activities (2010/2011)*.

**End of Attachment B
24 November 2011**

Attachment C: Project site, water licences and associated environmental layers for Bayside Brunswick Concept Plan (MP 05_0091).

